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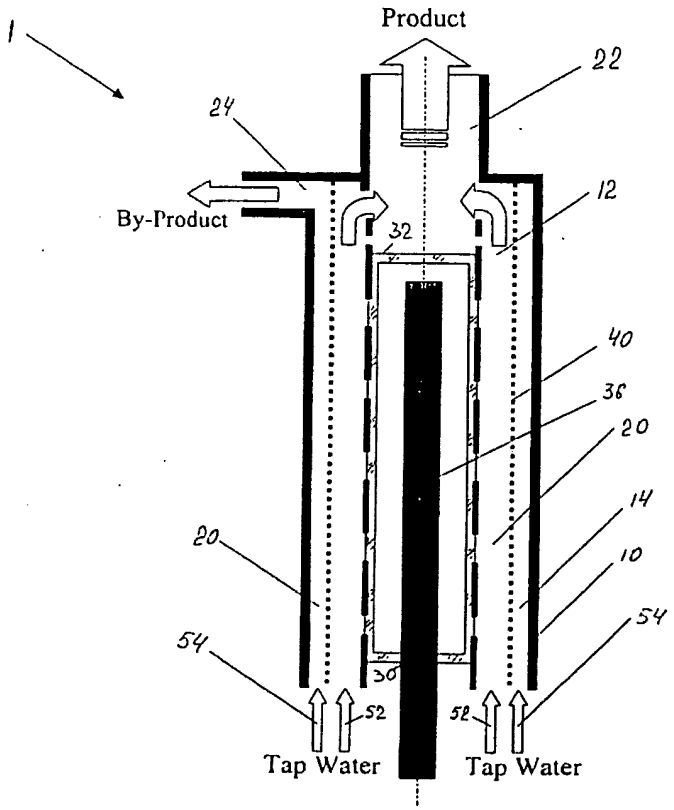
[Continued on next page]

(54) Title: ACTIVATED WATER APPARATUS AND METHODS



(57) Abstract: An apparatus (1) subjects water to waves from an RF plasma. This allows continuous production of "activated water" characterized by cluster sizes below about 4 molecules per cluster, water having pH below 4 or above 10, or water having ORP of less than -350 mV or more than + 800 mV. The basic frequency of the plasma is preferably between 0.44 MHz and 40.68 MHz, and the plasma is preferably modulated at a frequency between 10 kHz and 34 kHz. Flow rates typically range from 20 l/hr to about 2000 l/hr. Activated water can be used for many purposes, including antimicrobial cleaning of worktable, floor, wall, knife, transport and other surfaces, for example, in meat processing facilities and hospitals.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/49310

A. CLASSIFICATION OF SUBJECT MATTER
IPC(7) : B01J 19/08; H05F 3/00
US CL : 422/186, 186.04; 204/164
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : C25D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 4,954,320 A (BIRMINGHAM et al.) 04 September 1990 (04.09.1990), col. 2, line 67 to col. 3, line 2; col. 3, lines 15-25; col. 4, lines 66-68; col. 6, lines 13-16; col. 6, lines 63-66; col. 8, lines 40-45, and Fig. 4.	1-2, 6-8 --- 3-5,9
Y	US 5,965,009 A (SHIMAMUNE et al.) 12 October 1999 (12.10.1999), col. 8, lines 30-32.	13-16,18
Y	JP 11-253522 A (YAMADA, Makoto) 21 September 1999 (21.09.1999), abstracts.	13-15,17

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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INTERNATIONAL SEARCH REPORT

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Continuation of B. FIELDS SEARCHED Item 3:
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search terms: water, radio frequency, plasma